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NWAKAMMA, CHIBUIKE K	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,697	AKKERMANS, ANTONIUS HERMANUS MARIA	
	Examiner	Art Unit	
	CHIBUIKE K. NWAKAMMA	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 7-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 7-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

An amendment (RCE) dated 13 Jan. 2009 has been considered with the following results.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 and 7-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1, lines 8-9 recite "wherein the control unit is designed, during a jump operation, to **continuously** generate said control signal SCL". Applicant discloses on page 11, lines 32-33 "during a jump, the control unit 90 uses the information in said shape memory 310 when generating said actuator drive signal SCL. The claim recitation and applicant's disclosure are not the same.

Claim 7, lines 2-3 recite similar features as claim 1. Therefore, the same analysis as provided in claim 1 applies for claim 7.

Claims which have not been mentioned are rejected because these claims are dependent on the rejected base claim.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 7, 13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (US 5442604) in view of Tsukamura et al (US 5157642).

Regarding claim 1, Osada discloses a disc drive apparatus (Fig. 1a) for optical discs comprising:

a frame (Fig. 5a, not shown but inherent, i.e., housing of the optical disc drive);

a sledge (Fig. 1a, element 18 and col. 1, lines 53-57) displaceably mounted with respect to said frame (Fig. 1, element 19);

a lens actuator (Fig. 1a, elements 3, 3L, 6; Col. 2, lines 19-22 and 45-48) displaceably mounted with respect to said sledge 18;

a control unit (Fig. 1, elements 13, 15A, 5) for generating a control signal for the lens actuator (Fig. 1a, elements 3, 3L, 6);

wherein the control unit (Fig. 1, element 5) is designed, during a jump operation (Fig. 1, element 13A and col. 2, lines 14-19), to generate said control signal for the lens actuator (Col. 9, lines 62-67). **But** does not disclose, at least partly on the basis of an actuator deviation signal representing a difference between actuator position and sledge position irrespective of a position of the lens actuator with respect to an optical disk..

Tsukamura discloses, if the positions of the fine actuator and coarse actuator are relatively deviated (col. 4, lines 44-45). Further Tsukamura teaches a spot position detecting section (Fig. 4, element 16) that detects positions of signals generated by the fine actuator 11 and coarse actuator 10 and obtains a difference signal via subtracting circuit 16C.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Osada to include the teachings of Tsukamura to generate a control signal partly on the basis of an actuator deviation signal representing a difference between actuator position and sledge position irrespective of a position of the lens actuator with respect to an optical disk. The modification would have been obvious for the benefit of balancing the right and left images formed on the two-divided detector and to detect the deviation of the objective lens relative to the coarse actuator from the push-pull signal LE (Tsukamura; col. 4, lines 48-49 and 56-58).

Claim 17 is a method claim correspondent to apparatus claim 1. Therefore, claim 17 is analyzed and rejected as previously discussed with respect to claim 1.

Regarding claim 7, Osada in view of Tsukamura discloses the apparatus according to claim 1.

Tsukamura further disclose, a control unit (Fig. 4, elements 17-18, SW2) comprises a control circuit (Fig. 4, elements 17, SW2) having an input receiving said

actuator deviation signal (output signal from element 16C) and having an output providing said lens actuator control signal (Fig. 4);

the control circuit (Fig. 4, element 17) comprising a proportional branch (element 17 input signal branch) generating a control signal contribution proportional to said actuator deviation signal (output signal from element 16C).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Osada to include the teachings of Tsukamura where a control circuit having an input receiving said actuator deviation signal and having an output providing said lens actuator control signal; the control circuit comprising a proportional branch generating a control signal contribution proportional to said actuator deviation signal, so, to detect both fine and coarse actuators.

Regarding claim 13, Osada in view of Tsukamura discloses the apparatus according to claim 7.

Osada further discloses wherein said control unit (Fig. 1a; Col. 9, lines 40-42) is designed, in a jump mode, to generate its actuator control signal such as to cause an oscillating movement of the lens actuator corresponding to a track shape (col. 2, lines 14-26, 41-47; col. 6, lines 18-34, and Col. 9, line 62-Col. 10, line 24. It is obvious to one of ordinary skill in the art to recognize that when the seeking operation is effected, that the laser beam has been moved in accordance to a track shape).

3. Claims 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (US 5442604) in view of Tsukamura et al (US 5157642) and further in view of Tomonori et al (EP 0862169 A1).

Regarding claim 8, Osada in view of Tsukamura discloses the apparatus as discussed in claim 7.

Osada further discloses, wherein said control circuit (Fig. 8, elements 13, 15, 24) further comprises:

an adder (Fig. 8, element S) having an output connected to said circuit output (Fig. 8, element 13, 15, 24);

a first amplifier (Fig. 9, element AP) having an input coupled to said circuit input (Fig. 8, element 7B). **However**, does not disclose having an output coupled to an input of said adder.

Tomonori discloses an amplifier (Fig. 24, element 294) having an output coupled to an input of said adder (Fig. 4A, element E2, i.e. TES. The output of the amplifier, which is E2 is connected to the input of the adder in Fig. 4A, element 128 via the A/D circuit).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura with the teachings of Tomonori by disclosing a first amplifier having an output coupled to an input of said adder, so, a fluctuation which drops like noises in the tracking error signal can be erroneously prevented from becoming a zero cross point in a low magnitude portion (Tomonori; Col. 3, lines 28-31).

Regarding claim 9, Osada in view of Tsukamura and Tomonoro further discloses the apparatus according to claim 8.

Tsukamura further discloses, wherein said control circuit (Fig. 4, elements 17-18, SW1-SW2) further comprises:

a differentiating circuit (Fig. 4, element 15) having an input coupled to said circuit input; and a plurality of amplifiers (Fig. 4, elements 19A-B) where the input of element 19A is coupled to the output of the differentiating circuit (Fig. 4, element 15). **But** does not disclose, having an output coupled to an input of said adder.

Tomonori discloses an amplifier having an output coupled to an input of an adder, (Fig. 34 comprises a circuit component, element 340. Further, Fig. 34 is part of the PID circuit of Fig. 4A and Fig. 4A is a circuitry found in Fig. 1B and 1A, element 16. It is obvious that the amplifier circuit 34 of Fig. 1A comprises an output signal coupled to the input of an adder circuit of Fig 4, elements 104, 120, 182. That is, Fig. 1A, element 34 is coupled to element 16 where element 16 comprises the circuitry of Fig. 4A and Fig. 34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura with the teachings of Tomonori where the output of an amplifier is coupled to the input of an adder, so, provide enhanced control signals for the actuator deviation signal that represents a difference/deviation between the coarse actuator and fine actuator.

Regarding claim 10, Osada in view Tsukamura and Tomonori discloses the apparatus according to claim 8.

Osada further discloses a set-point generator (Fig. 1a, element 9) generating a sledge motor drive signal (Fig. 1a, element 21. The signal from the slider drive circuit is transmitted to the motor circuit);

an optical detector (Fig. 1a, element 23) generating an optical read signal; wherein said control circuit (Fig. 1a) further comprises:

processing means (Fig. 1a, elements 4, 13, 22, 13B) having an input coupled to receive said read signal (Signal from element 23 is equated as read signal) and designed to process the optical read signal for generating an actuator displacement signal indicating the displacement of the actuator with respect to tracks of the disc (Read signal is outputted from element 5 to the tracking actuator 3. It is obvious the signal indicates displacement of actuator with respect to tracks of the disc 10). **However**, does not disclose a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an output signal representing the number of zero-crossings per unit time; a low-pass filter having an input coupled to an output of said zero-crossings counter; a subtractor having an inverting input coupled to an output of said low-pass filter having a non-inverting input coupled to receive said sledge motor drive signal and having an output coupled to an input of said adder.

Tsukamura discloses, a low-pass filter (Fig. 4, elements 16A-B) having inputs and a subtractor (Fig. 4, element 16C) having an inverting input coupled to an output of

said low-pass filter 16A, having a non-inverting input coupled to receive said sledge motor drive signal LE, S1. **But** does not disclose a low-pass filter with inputs coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada with the teachings of Tsukamura to incorporate a low-pass filter having an input and a subtractor having an inverting input coupled to an output of said low-pass filter having a non-inverting input coupled to receive said sledge motor drive signal, so, to obtain a control signal that drives the fine and coarse actuators to operate efficiently.

Osada in view of Tsukamura does not disclose a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an output signal representing the number of zero-crossings per unit time; and a low-pass filter with input coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder.

Tomonori discloses a zero-crossings counter (Fig. 4A, element 110) having an input coupled to an output of said processing means (Fig. 1A, element 18), and designed to generate an output signal, i.e., resultant data, representing the number of zero-crossings per unit time (Col. 11, lines 40-50);

a low-pass filter (Fig. 1A, element 28; Col. 8, line 54-Col. 9, line 4. The read LSI circuit comprises of a filter. So, the filter read on the low pass filter) having an input coupled to an output of said zero-crossings counter (Fig. 4A, element 110. The zero-

crossings counter, which is a component of the controller circuit, i.e., Fig 1A, element 10, receives a signal via the MPU circuit 14. The MPU circuit outputs the signal to the read LSI circuit which comprises the filter circuit);

a subtractor (Fig. 24, element 294; Col. 31, lines 1-11) having an inverting input coupled to an output of said low-pass filter (Fig. 1A, element 28; Col. 8, line 54-Col. 9, line 4. The read LSI circuit comprises of a filter. So, the filter read on the low pass filter), and having an output coupled to an input of said adder (Fig. 4A, elements 104, 120, 182 and Fig. 1A-B).

In addition, Tomonori further teaches an optical detector (Fig. 1A, element 32) generating an optical read signal (Fig. 1A, element RD; Col. 8, line 54-Col. 9, line 4. The detector 32, generates MO and ID signals via the head amplifier 34, which converts to an RD signal via the read LSI circuit 28); and processing means (Fig. 1A, element 18; Col. 8, line 12-Col. 9, line 11. The Formatter circuit has an input coupled to receive a read signal, RD via the Decoder circuit) having an input coupled to receive said read signal (Fig. 1A, element RD; Col. 8, line 54-Col. 9, line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura to include the teachings of Tomonori by incorporating a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an output signal representing the number of zero-crossings per unit time; and a low-pass filter with input coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder, so, to prevent the track counting operation by

the zero-cross point to be erroneously performed and to measure the eccentricity amplitude and phase based on detection of the zero cross point of the tracking error signal as information in a state in which the driving of the carriage and lens by a positioner is stopped (Tomonori; col. 3, lines 53-55 and col. 4, lines 36-41).

Regarding claim 12, Osada in view of Tsukamura and Tomonori discloses the apparatus according to claim 9.

Tsukamura further discloses a control circuit comprising a second controllable switch (Fig. 4, element SW1) having a first input coupled to the output of second amplifier (Fig. 4, elements 19A-B), having a second input coupled to the output of said subtractor (Fig. 4, element 16C). **But,** does not teach having an output coupled to an input of said adder.

Tomonori teaches multiple switches coupled to the output of an adder (Fig. 4A, elements 142, 128, 170, 178, 146, 156, 186).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura with the teachings of Tomonori where a switch having a second input is coupled to the output of said subtractor, so, to ensure proper functionality and operability of the circuitry.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (Patent No. 5442604) in view of Tsukamura et al (US 5157642) and further in view of Tomonori et al (EP 0862169 A1) and Tokushuku et al (Patent No. 5539710).

Regarding claim 11, Osada in view of Tsukamura and Tomonori discloses the apparatus as discussed in claim 10.

Osada in view of Tsukamura and Tomonori does not disclose a third amplifier having an input coupled to an output of said subtractor and having an output coupled to an input of said adder.

Tokushuku discloses pluralities of amplifiers (Fig. 8, elements 69, 71, 72).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Tomonori with the teachings of Tokushuku by integrating and/or incorporating a third amplifier into Tomonori's Fig. 4A in order to have an input coupled to an output of said subtractor and having an output coupled to an input of said adder, so, an optical disc can be compatible with the read only type optical disc of different recording formats in order for users to produce their own video software and effectively utilize a large video software stock of read only type optical disc (Tokushuku; Col. 1, line 64-Col. 2, line 5).

5. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (Patent No. 5442604) in view of Tsukamura et al (US 5157642) and further in view of Fukue et al (EP 0938038 A2) and Tomonori et al (EP 0862169 A1).

Regarding claim 14, Osada in view of Tsukamura discloses the apparatus as discussed in claim 7.

Osada further discloses wherein the control unit in jump mode generates a tracking repetitive control signal (Fig. 1a, elements 5, 13A).

Osada in view of Tsukamura does not disclose, wherein said control unit comprises a shape memory containing track shape information and wherein the control unit in a jump mode is designed to read track shape information from said shape memory and to generate a tracking repetitive control signal on the basis of the track shape information in said shape memory;

wherein said control circuit further comprises:

a tracking repetitive control adder having an input coupled to an output of said first adder, having another input coupled to receive said tracking repetitive control signal, and having an output coupled to said circuit output.

Fukue discloses a control unit (Fig. 2, element 15) comprising a shape memory (Fig. 2, element 6) containing track shape information (Col. 3, line 52- Col. 4, line 31);

wherein the control unit (Fig. 3, element 52), is designed to read track shape information from said shape memory (Fig. 2, element 6) and to generate a tracking repetitive control signal on the basis of the track shape information in said shape memory (Col. 8, lines 20-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada with the teachings of Fukue by disclosing a control unit comprising a shape memory containing track shape information and designed to read track shape information from said shape memory, so, to have an easy way of handling data processors by creating easy manipulation process of objects displayed on a display device for users who have little knowledge of computers (Fukue; Col. 1, lines 13-17).

Osada in view of Tsukamura and Fukue does not disclose wherein said control circuit further comprises:

a tracking repetitive control adder having an input coupled to an output of said first adder having another input coupled to receive said tracking repetitive control signal and having an output coupled to said circuit output.

Tomonori discloses wherein said control circuit (Fig. 1A, element 10) further comprises:

a tracking repetitive control adder (Fig. 4A, element 120) having an input coupled to an output of said first adder (Fig. 4A, element 128), having another input coupled to receive said tracking repetitive control signal, i.e., lens position signal, and having an output coupled to said circuit output.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Fukue with the teachings of Tomonori by disclosing a tracking repetitive control adder having an input coupled to an output of said first adder having another input coupled to receive said tracking repetitive control signal and having an output coupled to said circuit output, so, to smoothen the tracking error signal and prevent the track counting operation by the zero cross point from being erroneously performed (Tomonori; Col. 3, lines 33-55).

Regarding claim 15 Osada in view of Tsukamura and further in view of Fukue and Tomonori discloses the apparatus according to claim 14.

Fukue further discloses, wherein the control unit in a jump mode, is designed to read track shape information (Fig. 3, elements 50, 52; Col. 8, lines 20-36) from said shape memory (Fig. 2, element 6) and to generate a compensating repetitive control signal on the basis of the track shape information in said shape memory (Figs. 2-3; Col. 3, line 52- Col. 4, line 31);

Tsukamura further discloses, wherein said control circuit (Fig. 4, elements 17-18, SW1-SW2) further comprises: a tracking repetitive control subtractor (Fig. 4, element 16C) having a non-inverting input coupled to said circuit input, having an inverting input coupled to receive said compensating repetitive control signal S1 and having an output coupled to the input end of said proportional branch (input branch of element 17 is coupled to the output signal of the subtractor 16C).

Furthermore, Tomonori discloses, wherein said control circuit (Fig. 1A, element 10) further comprises: a tracking repetitive control subtractor (Fig. 24, element 294), having a non-inverting input coupled to said circuit input having an inverting input coupled to receive said compensating repetitive control signal and having an output coupled to the input end of said proportional branch (see Fig. 4A; Col. 11, line 14-Col. 13, line 17).

Regarding claim 16 Osada in view of Tsukamura and further in view of Fukue and Tomonori discloses the apparatus according to claim 14.

Osada further discloses the control unit is in a track following mode (Col. 6, lines 18-49).

Osada in view of Tsukamura does not disclose wherein the control unit is designed to write track shape information into said shape memory.

Fukue discloses, wherein the control unit (Fig. 3, element 50) is designed to write track shape information into said shape memory (Col. 3, line 52- Col. 4, line 31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura with the teachings of Fukue where the control unit is designed to write track shape information into said shape memory when the control unit is in a track following mode, so, to manipulate objects and/or data according to the information of the track.

NOTE: If applicant disagrees with the above rejection, then a new rejection is as follows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 7, 13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (US 5442604) in view of Tsukamura et al (US 5157642) and Smith et al (US 5872676).

Regarding claim 1, Osada discloses a disc drive apparatus (Fig. 1a) for optical discs comprising:

a frame (Fig. 5a, not shown but inherent, i.e., housing of the optical disc drive);

a sledge (Fig. 1a, element 18 and col. 1, lines 53-57) displaceably mounted with respect to said frame (Fig. 1, element 19);

a lens actuator (Fig. 1a, elements 3, 3L, 6; Col. 2, lines 19-22 and 45-48) displaceably mounted with respect to said sledge 18;

a control unit (Fig. 1, elements 13, 15A, 5) for generating a control signal for the lens actuator (Fig. 1a, elements 3, 3L, 6);

wherein the control unit (Fig. 1, element 5) is designed, during a jump operation (Fig. 1, element 13A and col. 2, lines 14-19), to generate said control signal for the lens actuator (Col. 9, lines 62-67). **But** does not disclose, at least partly on the basis of an actuator deviation signal representing a difference between actuator position and sledge position irrespective of a position of the lens actuator with respect to an optical disk; and the control unit that is designed, during a jump operation to continuously generate said control signal S_{CL}.

Tsukamura discloses, if the positions of the fine actuator and coarse actuator are relatively deviated (col. 4, lines 44-45). Further Tsukamura teaches a spot position detecting section (Fig. 4, element 16) that detects positions of signals generated by the fine actuator 11 and coarse actuator 10 and obtains a difference signal via subtracting circuit 16C.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Osada to include the teachings of Tsukamura to generate a control signal partly on the basis of an actuator deviation

signal representing a difference between actuator position and sledge position irrespective of a position of the lens actuator with respect to an optical disk. The modification would have been obvious for the benefit of balancing the right and left images formed on the two-divided detector and to detect the deviation of the objective lens relative to the coarse actuator from the push-pull signal LE (Tsukamura; col. 4, lines 48-49 and 56-58).

Osada in view of Tsukamura does not teach the control unit that is designed, during a jump operation to continuously generate said control signal S_{CL}

Smith teaches a control unit (250, 216) that is designed, during a jump operation (track seek) to continuously generate a control signal S_{CL}(Fig. 7 and col. 8, lines 12-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura to include the teachings of Smith where the control unit that is designed, during a jump operation to continuously generate said control signal $S_{CL,}$ so, to reliably stabilize track jump.

Claim 17 is a method claim correspondent to apparatus claim 1. Therefore, claim 17 is analyzed and rejected as previously discussed with respect to claim 1.

Regarding claim 7, Osada in view of Tsukamura and Smith discloses the apparatus according to claim 1.

Tsukamura further disclose, a control unit (Fig. 4, elements 17-18, SW2) comprises a control circuit (Fig. 4, elements 17, SW2) having an input receiving said actuator deviation signal (output signal from element 16C) and having an output providing said lens actuator control signal (Fig. 4);

the control circuit (Fig. 4, element 17) comprising a proportional branch (element 17 input signal branch) generating a control signal contribution proportional to said actuator deviation signal (output signal from element 16C).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Osada to include the teachings of Tsukamura where a control circuit having an input receiving said actuator deviation signal and having an output providing said lens actuator control signal; the control circuit comprising a proportional branch generating a control signal contribution proportional to said actuator deviation signal, so, to detect both fine and coarse actuators.

Regarding claim 13, Osada in view of Tsukamura and Smith discloses the apparatus according to claim 7.

Osada further discloses wherein said control unit (Fig. 1a; Col. 9, lines 40-42) is designed, in a jump mode, to generate its actuator control signal such as to cause an oscillating movement of the lens actuator corresponding to a track shape (col. 2, lines 14-26, 41-47; col. 6, lines 18-34, and Col. 9, line 62-Col. 10, line 24. It is obvious to one of ordinary skill in the art to recognize that when the seeking operation is effected, that the laser beam has been moved in accordance to a track shape).

3. Claims 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (US 5442604) in view of Tsukamura et al (US 5157642) and further in view of Smith et al (US 5872676) and Tomonori et al (EP 0862169 A1).

Regarding claim 8, Osada in view of Tsukamura and Smith discloses the apparatus as discussed in claim 7.

Osada further discloses, wherein said control circuit (Fig. 8, elements 13, 15, 24) further comprises:

an adder (Fig. 8, element S) having an output connected to said circuit output (Fig. 8, element 13, 15, 24);

a first amplifier (Fig. 9, element AP) having an input coupled to said circuit input (Fig. 8, element 7B). **However**, does not disclose having an output coupled to an input of said adder.

Tomonori discloses an amplifier (Fig. 24, element 294) having an output coupled to an input of said adder (Fig. 4A, element E2, i.e. TES. The output of the amplifier, which is E2 is connected to the input of the adder in Fig. 4A, element 128 via the A/D circuit).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith with the teachings of Tomonori by disclosing a first amplifier having an output coupled to an input of said adder, so, a fluctuation which drops like noises in the tracking error signal

can be erroneously prevented from becoming a zero cross point in a low magnitude portion (Tomonori; Col. 3, lines 28-31).

Regarding claim 9, Osada in view of Tsukamura and further in view of Smith and Tomonoro further discloses the apparatus according to claim 8.

Tsukamura further discloses wherein said control circuit (Fig. 4, elements 17-18, SW1-SW2) further comprises:

a differentiating circuit (Fig. 4, element 15) having an input coupled to said circuit input; and a plurality of amplifiers (Fig. 4, elements 19A-B) where the input of element 19A is coupled to the output of the differentiating circuit (Fig. 4, element 15). **But** does not disclose, having an output coupled to an input of said adder.

Tomonori discloses an amplifier having an output coupled to an input of an adder, (Fig. 34 comprises a circuit component, element 340. Further, Fig. 34 is part of the PID circuit of Fig. 4A and Fig. 4A is a circuitry found in Fig. 1B and 1A, element 16. It is obvious that the amplifier circuit 34 of Fig. 1A comprises an output signal coupled to the input of an adder circuit of Fig 4, elements 104, 120, 182. That is, Fig. 1A, element 34 is coupled to element 16 where element 16 comprises the circuitry of Fig. 4A and Fig. 34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith with the teachings of Tomonori where the output of an amplifier is coupled to the input of an adder, so, provide enhanced control signals for the actuator deviation signal that represents a difference/deviation between the coarse actuator and fine actuator.

Regarding claim 10, Osada in view Tsukamura and further in view of Smith and Tomonori discloses the apparatus according to claim 8.

Osada further discloses a set-point generator (Fig. 1a, element 9) generating a sledge motor drive signal (Fig. 1a, element 21. The signal from the slider drive circuit is transmitted to the motor circuit);

an optical detector (Fig. 1a, element 23) generating an optical read signal; wherein said control circuit (Fig. 1a) further comprises:

processing means (Fig. 1a, elements 4, 13, 22, 13B) having an input coupled to receive said read signal (Signal from element 23 is equated as read signal) and designed to process the optical read signal for generating an actuator displacement signal indicating the displacement of the actuator with respect to tracks of the disc (Read signal is outputted from element 5 to the tracking actuator 3. It is obvious the signal indicates displacement of actuator with respect to tracks of the disc 10). **However**, does not disclose a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an output signal representing the number of zero-crossings per unit time; a low-pass filter having an input coupled to an output of said zero-crossings counter; a subtractor having an inverting input coupled to an output of said low-pass filter having a non-inverting input coupled to receive said sledge motor drive signal and having an output coupled to an input of said adder.

Tsukamura discloses, a low-pass filter (Fig. 4, elements 16A-B) having inputs and a subtractor (Fig. 4, element 16C) having an inverting input coupled to an output of said low-pass filter 16A, having a non-inverting input coupled to receive said sledge motor drive signal LE, S1. **But** does not disclose a low-pass filter with inputs coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada with the teachings of Tsukamura to incorporate a low-pass filter having an input and a subtractor having an inverting input coupled to an output of said low-pass filter having a non-inverting input coupled to receive said sledge motor drive signal, so, to obtain a control signal that drives the fine and coarse actuators to operate efficiently.

Osada in view of Tsukamura and Smith does not disclose a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an output signal representing the number of zero-crossings per unit time; and a low-pass filter with input coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder.

Tomonori discloses a zero-crossings counter (Fig. 4A, element 110) having an input coupled to an output of said processing means (Fig. 1A, element 18), and designed to generate an output signal, i.e., resultant data, representing the number of zero-crossings per unit time (Col. 11, lines 40-50);

a low-pass filter (Fig. 1A, element 28; Col. 8, line 54-Col. 9, line 4. The read LSI circuit comprises of a filter. So, the filter read on the low pass filter) having an input coupled to an output of said zero-crossings counter (Fig. 4A, element 110. The zero-crossings counter, which is a component of the controller circuit, i.e., Fig 1A, element 10, receives a signal via the MPU circuit 14. The MPU circuit outputs the signal to the read LSI circuit which comprises the filter circuit);

a subtractor (Fig. 24, element 294; Col. 31, lines 1-11) having an inverting input coupled to an output of said low-pass filter (Fig. 1A, element 28; Col. 8, line 54-Col. 9, line 4. The read LSI circuit comprises of a filter. So, the filter read on the low pass filter), and having an output coupled to an input of said adder (Fig. 4A, elements 104, 120, 182 and Fig. 1A-B).

In addition, Tomonori further teaches an optical detector (Fig. 1A, element 32) generating an optical read signal (Fig. 1A, element RD; Col. 8, line 54-Col. 9, line 4. The detector 32, generates MO and ID signals via the head amplifier 34, which converts to an RD signal via the read LSI circuit 28); and processing means (Fig. 1A, element 18; Col. 8, line 12-Col. 9, line 11. The Formatter circuit has an input coupled to receive a read signal, RD via the Decoder circuit) having an input coupled to receive said read signal (Fig. 1A, element RD; Col. 8, line 54-Col. 9, line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith to include the teachings of Tomonori by incorporating a zero-crossings counter having an input coupled to an output of said processing means and designed to generate an

output signal representing the number of zero-crossings per unit time; and a low-pass filter with input coupled to an output of said zero-crossings counter; and a subtractor having an output coupled to an input of said adder, so, to prevent the track counting operation by the zero-cross point to be erroneously performed and to measure the eccentricity amplitude and phase based on detection of the zero cross point of the tracking error signal as information in a state in which the driving of the carriage and lens by a positioner is stopped (Tomonori; col. 3, lines 53-55 and col. 4, lines 36-41).

Regarding claim 12, Osada in view of Tsukamura and further in view of Smith and Tomonori discloses the apparatus according to claim 9.

Tsukamura further discloses a control circuit comprising a second controllable switch (Fig. 4, element SW1) having a first input coupled to the output of second amplifier (Fig. 4, elements 19A-B), having a second input coupled to the output of said subtractor (Fig. 4, element 16C). **But** does not teach having an output coupled to an input of said adder.

Tomonori teaches multiple switches coupled to the output of an adder (Fig. 4A, elements 142, 128, 170, 178, 146, 156, 186).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith with the teachings of Tomonori where a switch having a second input is coupled to the output of said subtractor, so, to ensure proper functionality and operability of the circuitry.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (Patent No. 5442604) in view of Tsukamura et al (US 5157642) and Smith et al (US 5872676) and further in view of Tomonori et al (EP 0862169 A1) and Tokushuku et al (Patent No. 5539710).

Regarding claim 11, Osada in view of Tsukamura and further in view of Smith and Tomonori discloses the apparatus as discussed in claim 10.

Osada in view of Tsukamura and further in view of Smith and Tomonori does not disclose a third amplifier having an input coupled to an output of said subtractor and having an output coupled to an input of said adder.

Tokushuku discloses pluralities of amplifiers (Fig. 8, elements 69, 71, 72).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and further in view of Smith and Tomonori with the teachings of Tokushuku by integrating and/or incorporating a third amplifier into Tomonori's Fig. 4A in order to have an input coupled to an output of said subtractor and having an output coupled to an input of said adder, so, an optical disc can be compatible with the read only type optical disc of different recording formats in order for users to produce their own video software and effectively utilize a large video software stock of read only type optical disc (Tokushuku; Col. 1, line 64-Col. 2, line 5).

5. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (Patent No. 5442604) in view of Tsukamura et al (US 5157642) and Smith et al (US 5872676) and further in view of Fukue et al (EP 0938038 A2) and Tomonori et al (EP 0862169 A1).

Regarding claim 14, Osada in view of Tsukamura and Smith discloses the apparatus as discussed in claim 7.

Osada further discloses wherein the control unit in jump mode generates a tracking repetitive control signal (Fig. 1a, elements 5 and 13A).

Osada in view of Tsukamura and Smith does not disclose wherein said control unit comprises a shape memory containing track shape information and wherein the control unit in a jump mode is designed to read track shape information from said shape memory and to generate a tracking repetitive control signal on the basis of the track shape information in said shape memory; wherein said control circuit further comprises:

a tracking repetitive control adder having an input coupled to an output of said first adder, having another input coupled to receive said tracking repetitive control signal, and having an output coupled to said circuit output.

Fukue discloses a control unit (Fig. 2, element 15) comprising a shape memory (Fig. 2, element 6) containing track shape information (Col. 3, line 52- Col. 4, line 31);

wherein the control unit (Fig. 3, element 52) is designed to read track shape information from said shape memory (Fig. 2, element 6) and to generate a tracking repetitive control signal on the basis of the track shape information in said shape memory (Col. 8, lines 20-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith with the teachings of Fukue by disclosing a control unit comprising a shape memory containing track shape information and designed to read track shape information from said shape memory, so, to have an easy way of handling data processors by creating easy manipulation process of objects displayed on a display device for users who have little knowledge of computers (Fukue; Col. 1, lines 13-17).

Osada in view of Tsukamura and further in view of Smith and Fukue does not disclose wherein said control circuit further comprises:

a tracking repetitive control adder having an input coupled to an output of said first adder having another input coupled to receive said tracking repetitive control signal and having an output coupled to said circuit output.

Tomonori discloses wherein said control circuit (Fig. 1A, element 10) further comprises:

a tracking repetitive control adder (Fig. 4A, element 120) having an input coupled to an output of said first adder (Fig. 4A, element 128), having another input coupled to receive said tracking repetitive control signal, i.e., lens position signal, and having an output coupled to said circuit output.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and further in view of Smith and Fukue with the teachings of Tomonori by disclosing a tracking repetitive control adder having an input coupled to an output of said first adder having another

input coupled to receive said tracking repetitive control signal and having an output coupled to said circuit output, so, to smoothen the tracking error signal and prevent the track counting operation by the zero cross point from being erroneously performed (Tomonori; Col. 3, lines 33-55).

Regarding claim 15 Osada in view of Tsukamura and Smith and further in view of Fukue and Tomonori discloses the apparatus according to claim 14.

Fukue further discloses, wherein the control unit in a jump mode, is designed to read track shape information (Fig. 3, elements 50, 52; Col. 8, lines 20-36) from said shape memory (Fig. 2, element 6) and to generate a compensating repetitive control signal on the basis of the track shape information in said shape memory (Figs. 2-3; Col. 3, line 52- Col. 4, line 31);

Tsukamura further discloses, wherein said control circuit (Fig. 4, elements 17-18, SW1-SW2) further comprises: a tracking repetitive control subtractor (Fig. 4, element 16C) having a non-inverting input coupled to said circuit input, having an inverting input coupled to receive said compensating repetitive control signal S1 and having an output coupled to the input end of said proportional branch (input branch of element 17 is coupled to the output signal of the subtractor 16C).

Furthermore, Tomonori discloses, wherein said control circuit (Fig. 1A, element 10) further comprises: a tracking repetitive control subtractor (Fig. 24, element 294), having a non-inverting input coupled to said circuit input having an inverting input coupled to receive said compensating repetitive control signal and having an output

coupled to the input end of said proportional branch (Fig. 4A; Col. 11, line 14-Col. 13, line 17).

Regarding claim 16 Osada in view of Tsukamura and Smith and further in view of Fukue and Tomonori discloses the apparatus according to claim 14.

Osada further discloses the control unit is in a track following mode (Col. 6, lines 18-49).

Fukue further teaches wherein the control unit (Fig. 3, element 50) is designed to write track shape information into said shape memory (Col. 3, line 52- Col. 4, line 31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Osada in view of Tsukamura and Smith with the teachings of Fukue where the control unit is designed to write track shape information into said shape memory when the control unit is in a track following mode, so, to manipulate objects and/or data according to the information of the track.

Response to Arguments

6. Applicant's arguments filed 28 February 2009 with respect to claims 1 and 7-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Meyer (US 4627039), Park (US 6975566 B2), Ho et al (US 2005/0243664 A1), Liu (US 2006/0028933 A1), Shimada et al (US 5898654), Yoshimoto et al (US 5251194) and Hirano (US 4613963).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIBUIKE K. NWAKAMMA whose telephone number is (571)270-3458. The examiner can normally be reached on Mon-Thur and Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 5712727579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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18 Feb. 2009
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